REMARKS

Claims 1-13 are pending in the application. In order to expedite the prosecution of the application, Applicant has canceled claims 1-13, without prejudice to Applicant's right to pursue the canceled subject matters in a future application. At the same time, Applicant has added new claims 14-29. Support for the new claims can be found, *inter alia*, in the specification, and is summarized below:

Claim #	Page #	Line #
14	4 12 13	5-6 9-11 8-12
15,16,23,24	12	11-15
17,25	11 20 21	12 35 1
18,26	4	5-6
19,21,27,29	12	24,33-34
20	12 13	25-27 4-6
22	4 12 13	5-6 9-11,25-27 4-6
28	13	8-12

Accordingly, Applicant submits that there is no issue of new matter, and respectfully requests entry of the Amendment. Upon entry of the Amendment, claims 14-29 will be pending and under examination in the application.

Rejection Under 35 U.S.C. § 112, 1st Paragraph

In the February 22, 2008 Office Action, the Examiner rejects claims 5, 11 and 12 under 35 U.S.C. § 112 because the specification "does not reasonably provide enablement for compositions comprising any anti-tumor antibody whatsoever for the treatment of any cancer whatsoever." Additionally, the Examiner rejects claims 1, 2, 5 and 9 under 35 U.S.C. § 112 because the specification "does not reasonably provide enablement for compositions comprising any substance or any chemotherapeutic agent whatsoever."

In response, Applicant has canceled claims 1-13, without prejudice, and added new claims 14-29. The new claims are written such that reasonable enablement can be found in the specification. Thus, independent claims 14 and 21 recite the specific structure of the β-glucan and the specific cancer cell types for which treatment with antibodies can be enhanced by said β-glucan. Since the rest of the new claims are dependent on either of these two independent claims, this claim amendment should no longer raise any issue of enablement.

Rejection Under 35 U.S.C. § 102

Yan et al.

In the February 22, 2008 Office Action, the Examiner rejects claims 1-13 under 35 U.S.C. § 102 as being anticipated by Yan et al. which discloses a "β-glucan composition capable of producing a synergistic complement-mediated anti-tumor effect . . . in combination with anti-tumor antibodies," wherein the β-glucan is from yeast, and having a molecular weight of about 10 kDa.

In response, Applicant has canceled claims 1-13, without prejudice, and added new claims 14-29. MPEP 706.02(IV) states that:

> "[F]or anticipation under 35 U.S.C. 102, the reference must teach every aspect of the claimed invention either explicitly or impliedly. Any feature not taught must be inherently present."

Applicant submits that, contrary to the Examiner's assertion, the reference glucan cannot be identical to the claimed glucan because the reference glucan has been characterized as only a β-1,3-glucan without β-1,3 side chains having a molecular weight of about 10 kDa (page 3046, left column, last paragraph) while the claimed glucan has been characterized as having a molecular weight of more than 10 kDa, and having a β-1,3 backbone with β-1,3 side chains linked to the backbone with a β-1,6 glycosidic bond.

Herlyn et al.

The Examiner also rejects claims 1-13 as being anticipated by Herlyn et al. which discloses a β-1,3 lentinan with a molecular weight of 400-800 kDa that can increase the anti-tumor effect of antibodies.

In response, Applicant has canceled claims 1-13, without prejudice, and added new claims 14-29. While the reference glucan having a molecular weight of 400-800 kDa is obtained from mushroom and consists of β-1,6-linked side chains made up of only one glucose unit, the claimed glucan having a molecular weight of 10-350 kDa is obtained from yeast and consists of side

chains having more than one glucose units linked together in a β-1,3 manner. Therefore, the claimed glucan cannot be identical to, or anticipated by, the reference glucan.

Suzuki et al.

The Examiner rejects claims 1-13 as being anticipated by Suzuki et al. which discloses a lentinan with a molecular weight of 4-1,000 kDa that shows synergistic effect when combined with chemotherapeutic agents.

In response, Applicant has canceled claims 1-13, without prejudice, and added new claims 14-29. As stated above, while the reference glucan is obtained from mushroom and consists of β-1,6-linked side chains made up of only one glucose unit, the claimed glucan consists of side chains having more than one glucose units linked together in a β-1,3 manner. Therefore, the claimed glucan cannot be identical to, or anticipated by, the reference lentinan.

Jamas et al.

The Examiner rejects claims 1-13 as being anticipated by Jamas et al. which discloses a modified yeast glucan that enhances the effectiveness of chemotherapeutic agents by reducing side effects.

In response, Applicant has canceled claims 1-13, without prejudice, and added new claims 14-29. As stated above, the reference glucan is a yeast glucan having been modified to produce a higher ratio of β-1,6 linkages, wherein the glucose units in the side chains are linked in a β-1,6 manner (see

Figure 4), in contrast to the claimed yeast glucan which has not been modified in the same manner and the side chains have more than one glucose units linked together in a β-1,3 manner. Therefore, Applicant submits that the claimed glucan cannot be identical to, or anticipated by, the reference glucan.

Summary

In summary, because claims 1-13 have been canceled, without prejudice, the Examiner's rejection of these claims under 35 U.S.C. § 102 is moot. Applicant thus respectfully requests that the rejection be withdrawn. Additionally, the Examiner's assertion that the claimed glucan is identical to or anticipated by the glucans of Yan et al., Herlyn et al., Suzuki et al. or Jamas et al. should not be applicable to the new claims 14-29 as reasoned in the above discussion.

Rejection Under 35 U.S.C. § 103

The Examiner rejects claims 1-13 as being *prima facie* obvious over Yan et al., Herlyn et al., Suzuki et al. and Jamas et al. It would have been obvious to one of ordinary skill in the art at the time of the invention to prepare a pharmaceutical composition comprising both a beta-glucan and either a chemotherapeutic agent or antibody according to the cited references. One of ordinary skill in the art would have been motivated to produce such a composition because of one's skills and likelihood of success as suggested or taught by the prior art references.

In response, Applicant has canceled claims 1-13, without prejudice, and added new claims 14-29. As explained above, none of the new claims is anticipated by any of the prior art

references. Moreover, all of the glucans disclosed by the references contain either no side chain, or side chains having only one or at most two glucose units linked together in a β-1,6 manner. The references, individually or in combination, do not teach or suggest using glucans having side chains that consist of more than one glucose units linked together in a β-1,3 manner.

Furthermore, the glucans in the prior art references are administered intravenously, subcutaneously or intraperitoneally. In contrast, the claimed glucan is administered orally. Applicant submits that a person of ordinary skill in the art would not have had a reasonable expectation of success in using the Applicant's composition which comprises an orally administered glucan in combination with an antibody so as to enhance the anti-tumor effect of said antibody.

MPEP 2141(III) states that:

> "Objective evidence or secondary considerations such as unexpected results, commercial success, long-felt need, failure of others, copying by others, licensing, and skepticism of experts are relevant to the issue of obviousness and must be considered in every case in which they are present. When evidence of any of these secondary considerations is submitted, the Examiner must evaluate the evidence."

While it is well known among persons of ordinary skills in the art that medications that can be orally administered are usually preferable to those that can only be administered by other routes such as intravenous injections, the glucans in

the prior art references are administered intravenously, subcutaneously or intraperitoneally.

It is respectfully submitted that the reason for this choice of route of administration was the skepticism that orally administered β-glucans would be effective at all. Recent literature, including work by the same group that published the Yan reference, shows that at the time of the present invention, there was no reasonable expectation of success that orally administered β-glucan would be effective in enhancing the efficacy of anti-tumor antibodies.

The harsh environment of the stomach and the difficulty of transmucosal transport of large organic molecules from the gastrointestinal tract into the blood stream do not suggest that oral administration of large polysaccharides such as β-glucans would be feasible in producing any desirable biological effects. Therefore, the present invention not only has demonstrated the unexpected results that even orally administered β-glucans can effectively enhance the anti-tumor effects of antibodies, but also fulfilled a long-felt need that patients, when given a choice, would typically prefer oral administration of a medication to other routes of administration such as intravenous injection because of reduced pain and higher patient compliance associated with oral administration. It should be noted that Applicant's results contravene the conventional wisdom in the art at the time. This is recognized as strong evidence of non-obviousness.

In summary, it would have been unobvious to one of ordinary skills in the art at the time of the present invention that orally

administering a β-glucan from yeast would achieve any therapeutic usefulness when combined with an anti-tumor antibody. It would have been equally unobvious to one of ordinary skills in the art at the time of the present invention to make and use a β-glucan having side chains that consist of more than one glucose units linked together in a β-1,3 manner.

Because claims 1-13 have been canceled without prejudice, the rejection of these claims under 35 U.S.C. § 103 is moot. Additionally, the new claims 14-29 should not raise a similar rejection because, in view of the foregoing discussion, *prima facie* obviousness cannot be established.

Double Patenting

The provisional obviousness-type double patenting rejection of claims 1-13 over U.S. Application No. 10/621,027 and 11/334,763 is moot because the claims have been canceled without prejudice. Additionally, Applicant submits that none of the new claims 14-27 is anticipated by any of the claims of the above two applications. Accordingly, the present Amendment should not raise any issue of double patenting, provisional or otherwise.

CONCLUSION

Applicant contends that the new claims 14-27 have fully addressed the Examiner's rejections discussed in the February 22, 2008 Office Action, and should not raise additional issues. Therefore, this application is in full compliance with all requirements. Accordingly, Applicant respectfully urges the Examiner to place this application in conditions for allowance.

If a telephone interview would be of assistance in advancing the prosecution of the subject application, Applicant's undersigned attorney invites the Examiner to telephone him at the number provided below. If any fee is required, authorization is hereby given to charge the amount of any such fee to Deposit Account No. 50-1891.

Respectfully submitted,

Albert Wai-Kit Chan
Registration No. 36,479
Attorney for Applicant
Law Offices of
Albert Wai-Kit Chan, PLLC
World Plaza, Suite 604
141-07 20th Avenue
Whitestone, New York 11357
Tel: (718) 799-1000
Fax: (718) 357-8615
E-mail: chank@kitchanlaw.com